1a. Energy consumption trends and energy efficiency indicators in APEC

Joint APEC-IEA Training Workshop on End-use Energy Consumption Data and Energy Efficiency Indicators-Part 2

(20th APEC Workshop on Energy Statistics)

Online 15-17 November 2022

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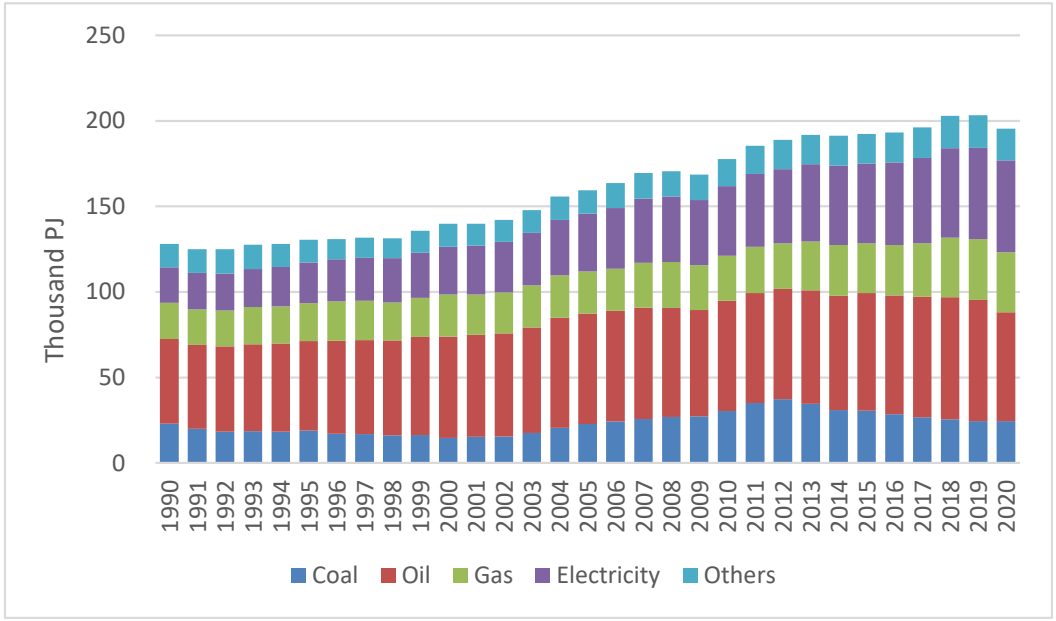
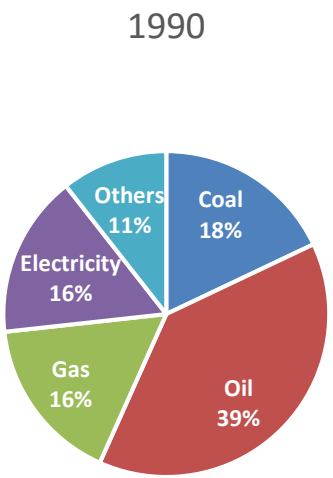
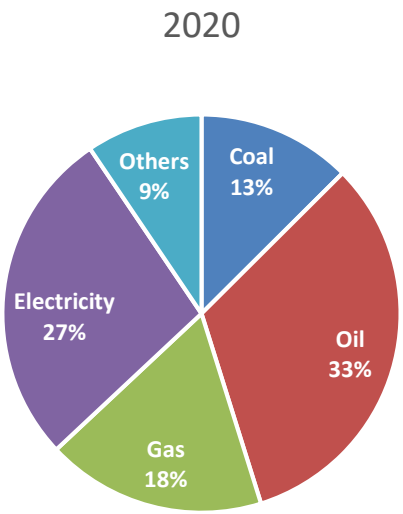
Outline

- Energy consumption trends in APEC
- Milestone
- Status of collection
  - Status
  - Challenges
- Sample analysis
- Closing thoughts

APEC final energy consumption by energy

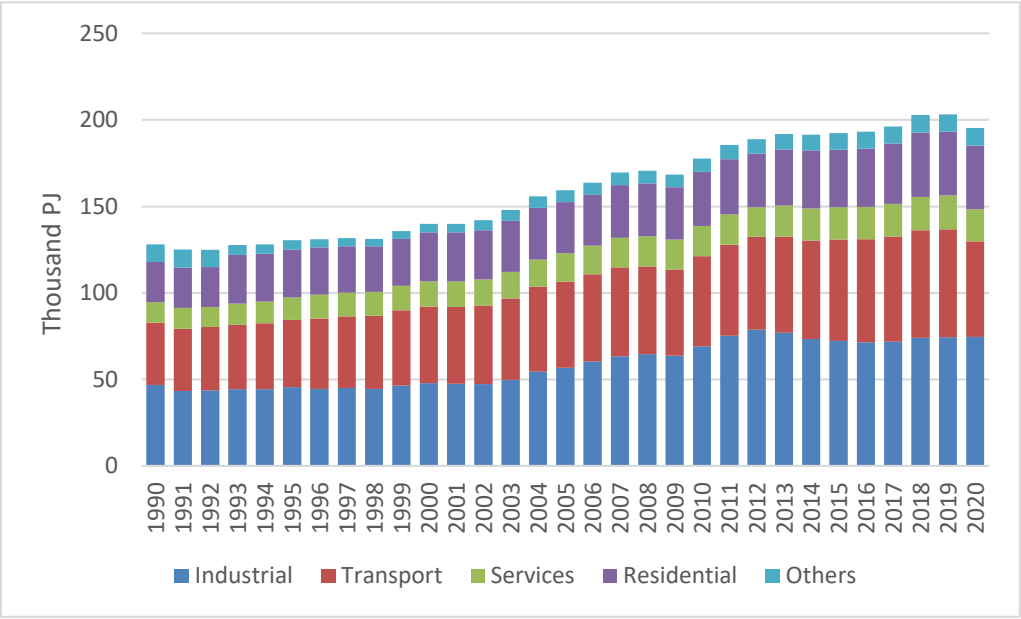


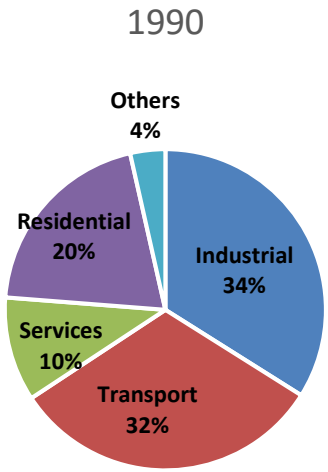


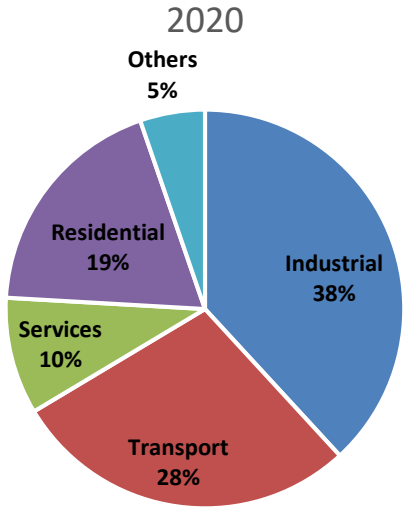


- APEC final energy consumption grew at a compounded annual growth rate (CAGR) of **1.4% from 1990 to 2020** but CAGR **from 2019 to 2020 was -3.9%** due to decreased economic activities (COVID-19 lockdowns)
- Electricity consumption grew the fastest with a CAGR of **3.2% from 1990 to 2020**, **3.3% from 1990-2019** and **1.0% from 2019 to 2020**
- Oil consumption grew at a CAGR of **1.2% from 1990 to 2019** but dropped by **10.1% from 2019 to 2020** due to travel restrictions during the COVID-19 pandemic (**0.8% from 1990 to 2020**)

APEC final energy consumption by sector







- Industrial energy consumption grew the fastest among the sectors from **1990 to 2020 with a CAGR of 1.6%;** from **2019 to 2020**, it still grew but at a lower rate of **0.3%**
- The transportation grew the fastest between **1990 and 2019 at 1.9% per annum** (CAGR), however there was **11.4% decline from 2019 to 2020**
- Similarly, the services sector (commercial) grew at a CAGR of **1.8% from 1990 to 2019** but **dropped by 6.0% from 2019 to 2020**

Milestone

December 2014	Introduction of Energy Efficiency template
March – April 2016	Collection of template from APEC economies
June 2017	Template revised per agreement in 28thEGEDA (November 2016)
November 2018 (29th EGEDA meeting)	EGEDA requested OECD/IEA members if they can share the IEA EEI template
April 2022	APEC/IEA Joint project IEA allowed APEC to use the IEA template

Status of collection

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Status

Submissions

Collection date	No of submissions
2018 (for 2016 data)	8 including 2 OECD/IEA EE templates
2019-20 (for 2017 data)	9 including 5 OECD/IEA EE templates
2020 (2018 data)	7 including 2 OECD/IEA EE templates
2021 (2019 data)	4 (including 2 OECD/IEA EE templates)
2022 (2020 data)	13 (including 7 OECD/IEA EE templates)

- ***We would like to request both non-OECD and OECD EGEDA members to please continue submission of EEI template; frequency is the same as annual data submission.***

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Challenges in filling-out the template

EEI template

Completeness

- ❑ Energy data
  - End-use consumption data are not available for most APEC member economies
- ❑ Activity data
  - Missing data
    - Sub-sector GVAs (industry and services)
    - Household activity (floor area, dwellings)
    - Vehicle stocks

Timeliness and Sustainability

- HKC and CT submit online regularly
- BD; PHL; RUS; SGP

❑ ***Reminder email around April***

Sample analysis

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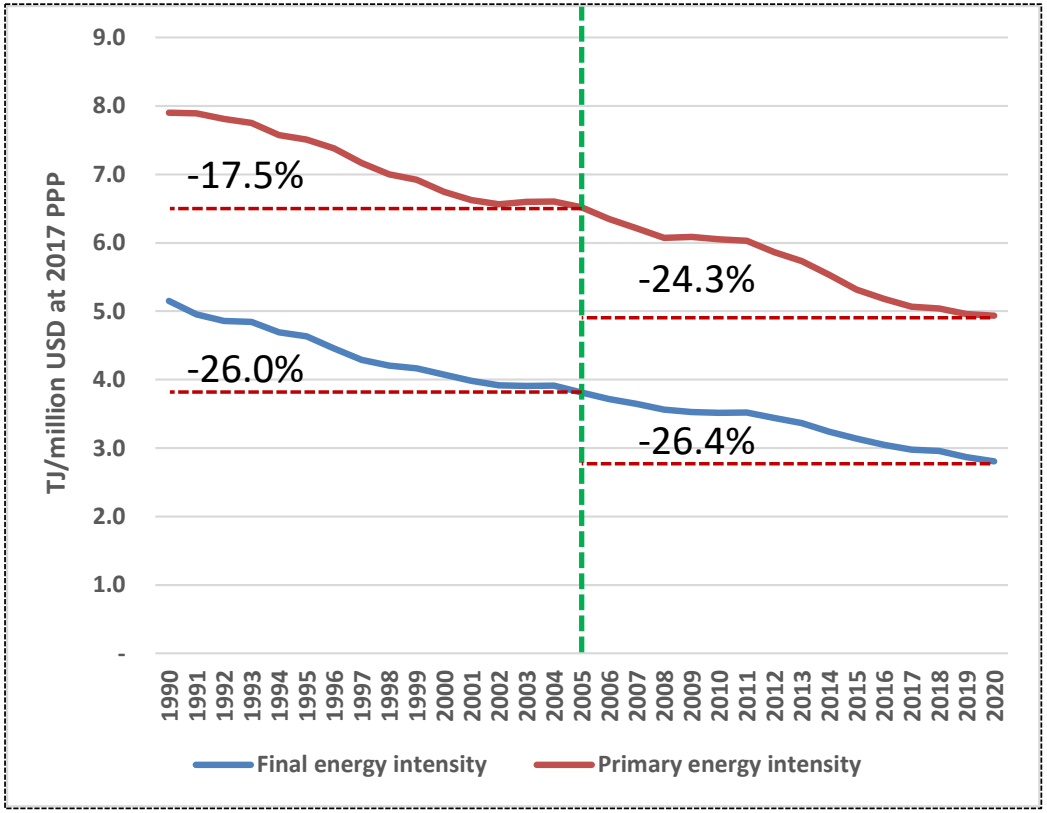
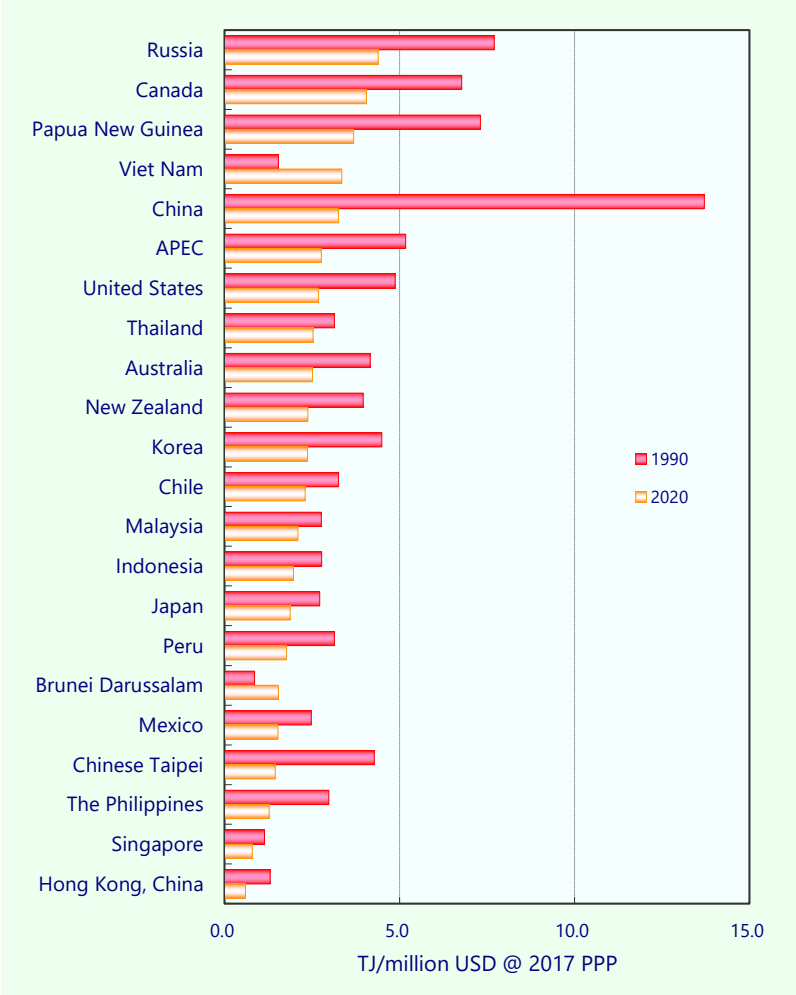
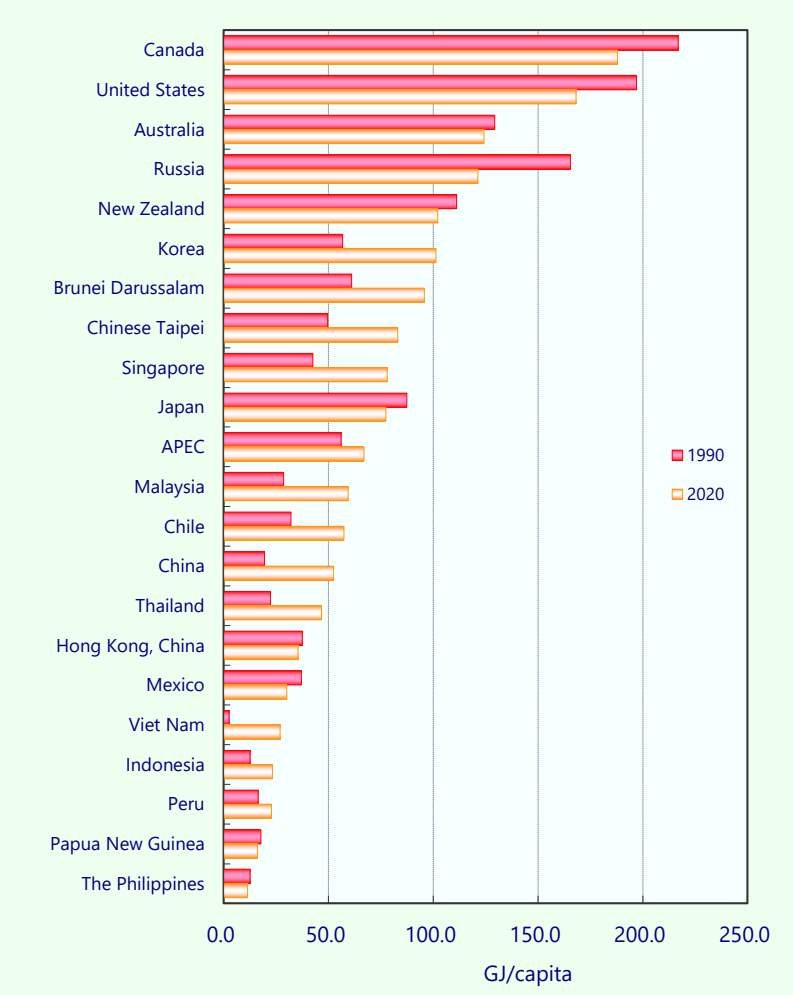
Energy intensities



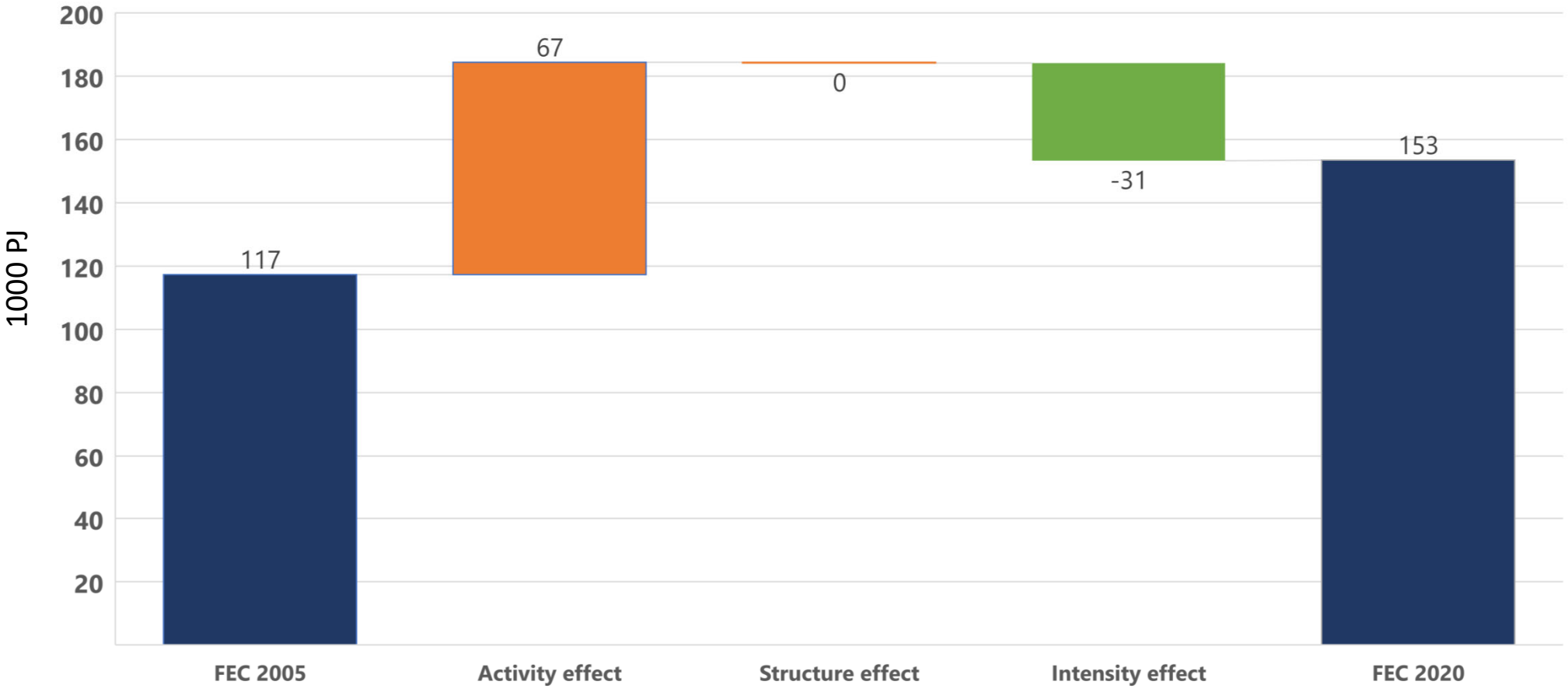
- Final energy intensity of APEC decreased by:
  - **45.5% from 1990 to 2020**
  - **26.0% from 1990 to 2005**
  - **26.4% from 2005 to 2020**
- Primary energy intensity decreased by:
  - **37.6% from 1990 to 2020**
  - **17.5% from 1990 to 2005**
  - **24.3% from 2005 to 2020**

Final energy intensity and final energy consumption per capita





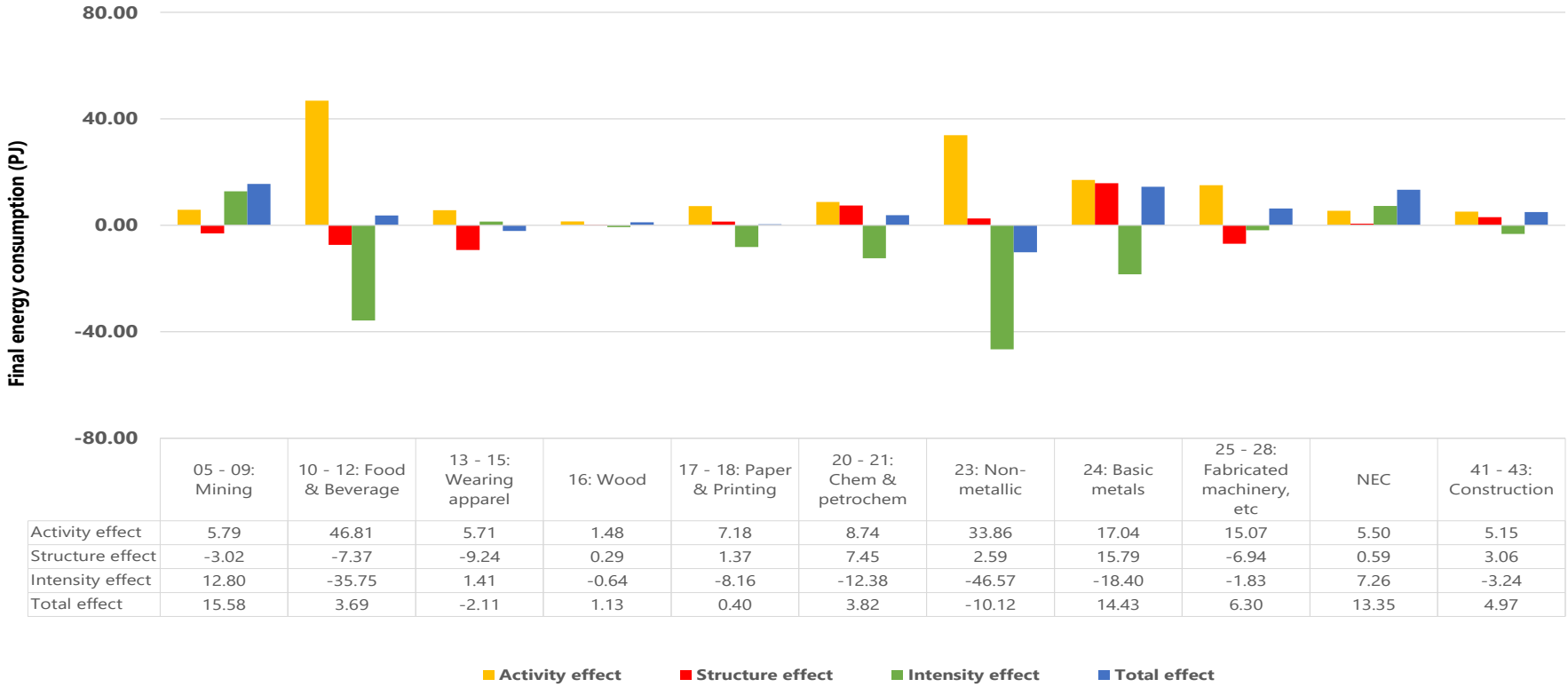
APEC trends by decomposition



Energy intensity reduction (31 EJ) offset the increase that would have been brought by activity (67 EJ)

Sectoral analysis (Industry)

Biggest reduction from energy intensive industries (2020 with 2005 as base)



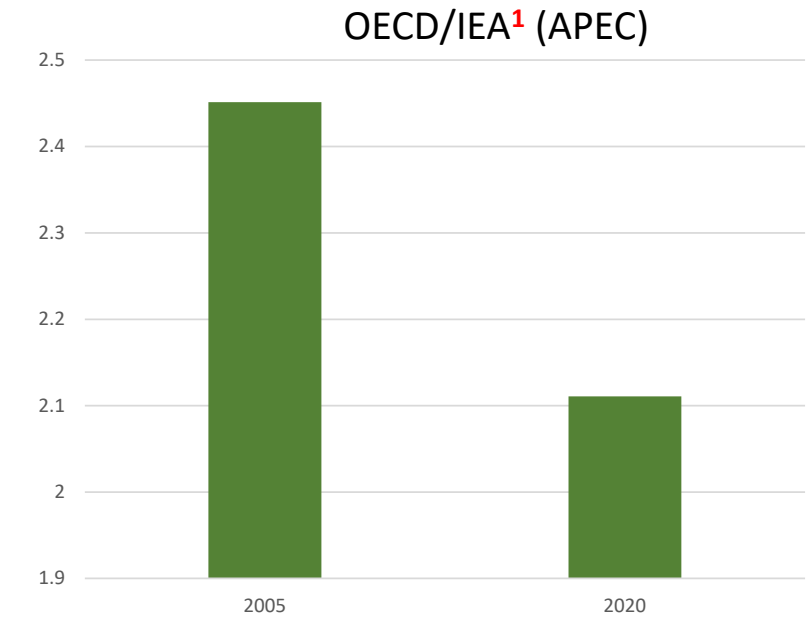
	05 - 09: Mining	10 - 12: Food & Beverage	13 - 15: Wearing apparel	16: Wood	17 - 18: Paper & Printing	20 - 21: Chem & petrochem	23: Non-metallic	24: Basic metals	25 - 28: Fabricated machinery, etc	NEC	41 - 43: Construction
Activity effect	5.79	46.81	5.71	1.48	7.18	8.74	33.86	17.04	15.07	5.50	5.15
Structure effect	-3.02	-7.37	-9.24	0.29	1.37	7.45	2.59	15.79	-6.94	0.59	3.06
Intensity effect	12.80	-35.75	1.41	-0.64	-8.16	-12.38	-46.57	-18.40	-1.83	7.26	-3.24
Total effect	15.58	3.69	-2.11	1.13	0.40	3.82	-10.12	14.43	6.30	13.35	4.97

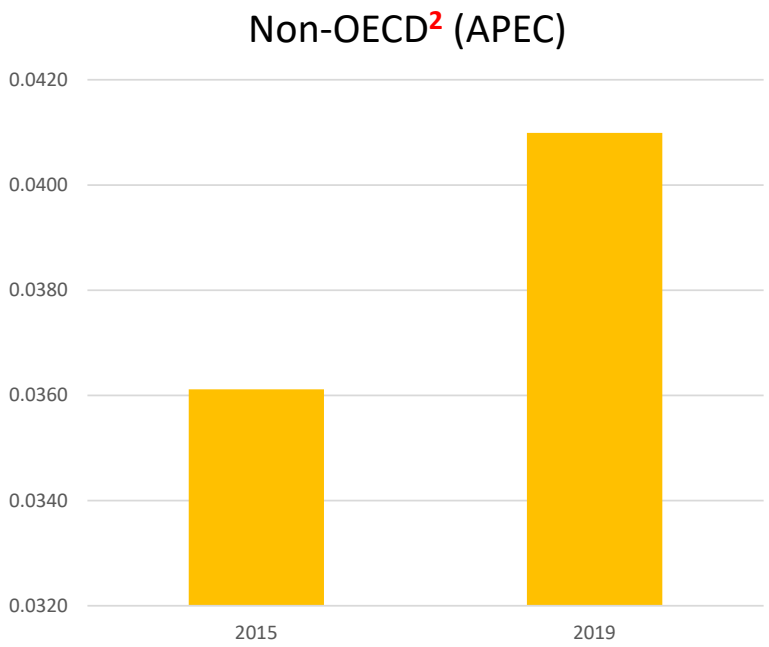
Sources: EGEDA, PSA, author's analysis

- ***Overall industry consumption trends was due to the large extent, energy intensity gains in most of the energy intensive manufacturing subsectors***

Sectoral analysis (Transport)

Passenger-km intensity





[1] includes AUS; CDA; CHL; JPN; ROK; NZ; USA
[2] HKC; PHL

Sources: energy efficiency indicators template

Passenger-km intensity = energy/passenger-km (car/light vehicle)

Addressing data gaps

Capability enhancement

- **19th APEC Energy Statistics Workshop (2021)**– APEC-IEA Joint Workshop on Energy Consumption Data and Energy Efficiency Indicators (Part 1)
- **20th APEC Energy Statistics Workshop (2022)**– APEC-IEA Joint Workshop on Energy Consumption Data and Energy Efficiency Indicators (Part 2)
- APEC-IEA Joint Energy Efficiency Indicators Project
- Continued collaboration with IEA - assessment of EEI template submission (HKC and CT)
- APEC funding for capability enhancement to conduct energy consumption survey
- Cooperation with EWG experts' group

Closing thoughts: better data = better analysis

- Decomposition method allows us to separate structural shifts or activity shifts, understanding better true trends in energy consumption as well as trends in economic activity that influence energy consumption in APEC.
- However, more useful analysis requires more detailed data. Decomposition of aggregate intensity is already a challenge (agriculture, in particular)
- Increase/initiate collaboration with other statistics agencies.

Q&A

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Thank you.

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